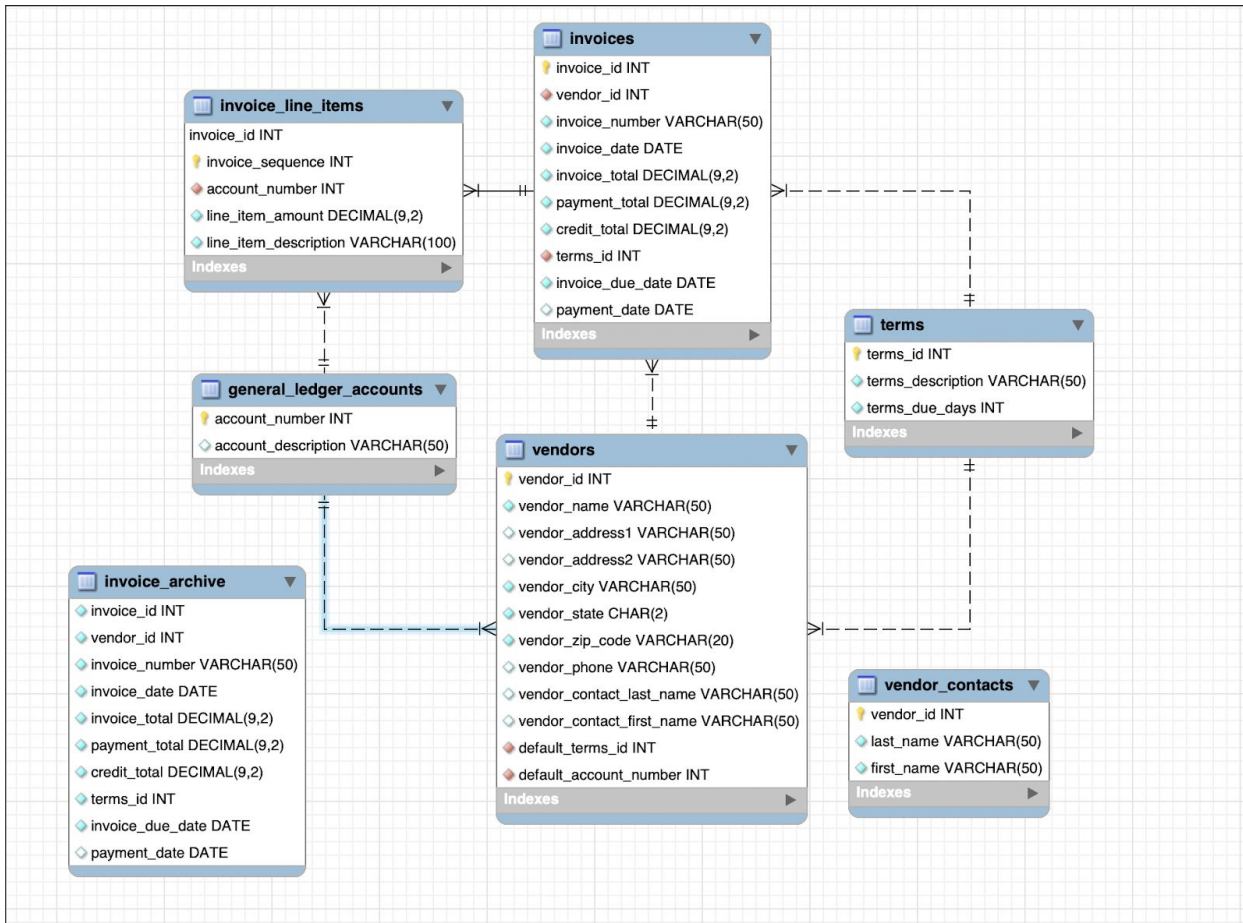


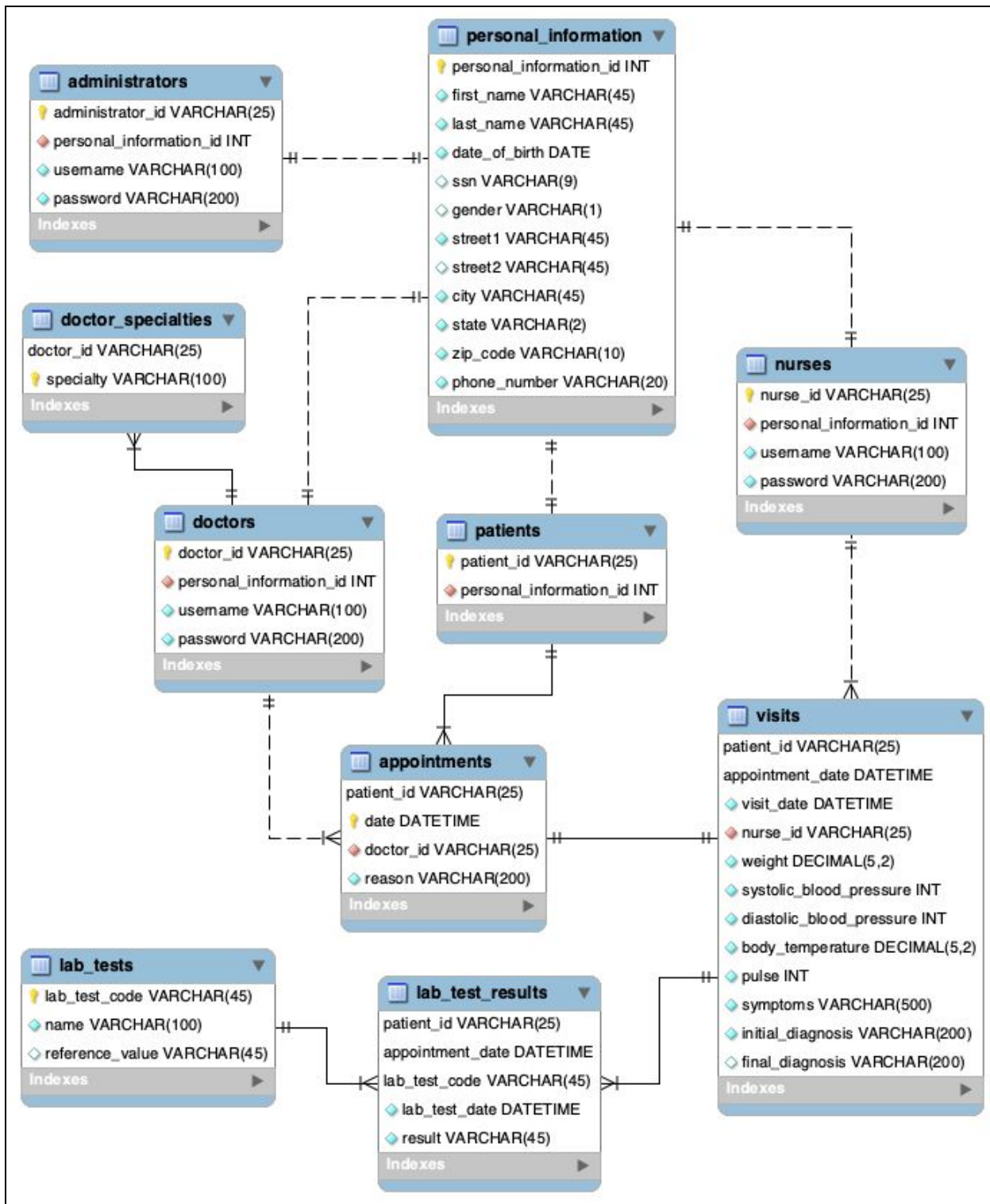
ALONSO AYALA ORTEGA

Part I EERD



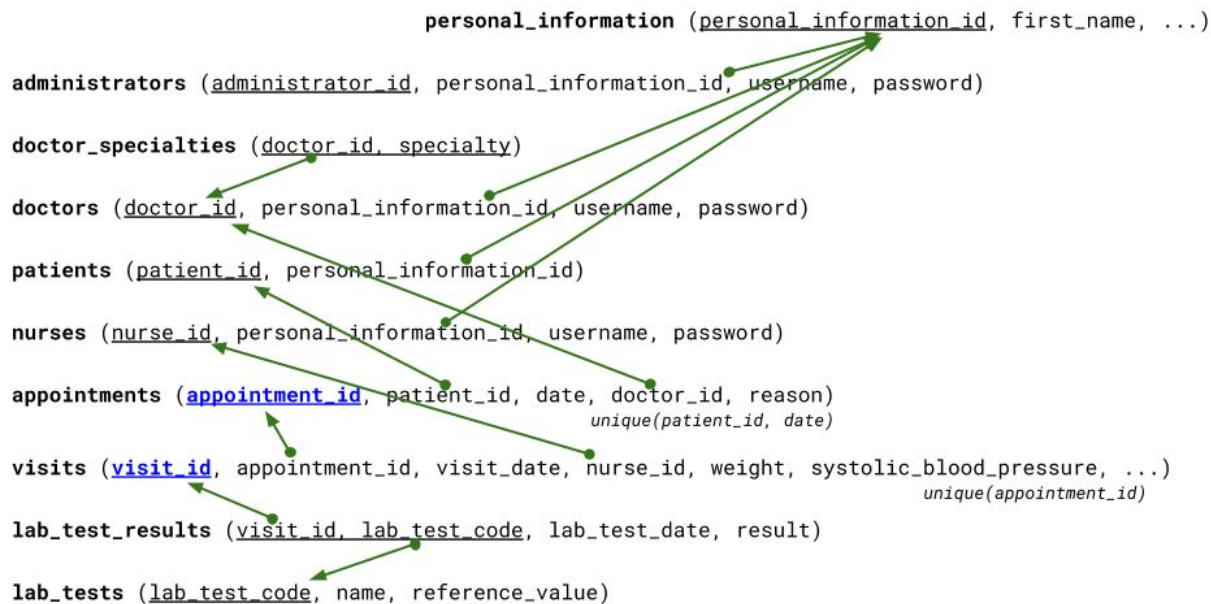
Part II

image-EERD



SurrogateKeys

Referential integrity with surrogate keys



Part III

Stored Procedure

```
USE clinic_management;
DROP PROCEDURE IF EXISTS getMostPerformedTestsDuringDates;
DROP FUNCTION IF EXISTS getLabTestResultTypeCount;
DROP FUNCTION IF EXISTS getLabTestCountByPatientAgeRange;
DELIMITER $

CREATE FUNCTION getLabTestResultTypeCount(lab_test_code_param VARCHAR(25), result_type
VARCHAR(45))
RETURNS INT
READS SQL DATA
BEGIN
    DECLARE lab_test_count INT;

    IF lab_test_code_param IS NULL OR result_type IS NULL THEN
        SIGNAL SQLSTATE 'HY000'
        SET MESSAGE_TEXT = 'You must specify both the lab_test_code_param and the result_type.',
        MYSQL_ERRNO = 1108;
    END IF;
```

```
SELECT COUNT(*) INTO lab_test_count
FROM lab_test_results
WHERE lab_test_code = lab_test_code_param
AND result = result_type;
```

```
RETURN lab_test_count;
END$
```

```
CREATE FUNCTION getLabTestCountByPatientAgeRange(lab_test_code_param VARCHAR(25),
start_age INT, end_age INT)
RETURNS INT
READS SQL DATA
BEGIN
    DECLARE lab_test_count INT;

    IF lab_test_code_param IS NULL OR start_age IS NULL OR end_age IS NULL THEN
        SIGNAL SQLSTATE 'HY000'
        SET MESSAGE_TEXT = 'You must specify the lab_test_code_param, start_age, and end_age.',
        MYSQL_ERRNO = 1108;
    END IF;

    IF start_age > end_age THEN
        SIGNAL SQLSTATE 'HY000'
        SET MESSAGE_TEXT = 'end_age must be greater or equal than start_age.', MYSQL_ERRNO =
        1108;
    END IF;
```

```
SELECT COUNT(lab_test_code) INTO lab_test_count
FROM lab_test_results
    INNER JOIN patients USING (patient_id)
    INNER JOIN personal_information USING (personal_information_id)
WHERE lab_test_code = lab_test_code_param
AND TRUNCATE(DATEDIFF(lab_test_date, personal_information.date_of_birth) / 365.25, 0)
BETWEEN start_age AND end_age;

RETURN lab_test_count;
END$
```

```
CREATE PROCEDURE getMostPerformedTestsDuringDates(IN startdate DATE, IN endate DATE)
BEGIN
    DECLARE all_tests_count INT;

    IF startdate IS NULL OR endate IS NULL THEN
```

```

    SIGNAL SQLSTATE 'HY000'
    SET MESSAGE_TEXT = 'You must specify a startdate and endate.', MYSQL_ERRNO = 1108;
END IF;
IF startdate > endate THEN
    SIGNAL SQLSTATE 'HY000'
    SET MESSAGE_TEXT = 'endate must be greater or equal than startdate.', MYSQL_ERRNO =
1108;
END IF;

SELECT COUNT(lab_test_code) INTO all_tests_count
FROM lab_test_results
WHERE lab_test_date BETWEEN startdate AND endate;

SELECT
    t.lab_test_code,
    t.name,
    COUNT(t.lab_test_code) AS tests_count,
    all_tests_count,
    COUNT(t.lab_test_code) / all_tests_count AS test_count_percentage,
    getLabTestResultTypeCount(r.lab_test_code, 'normal') AS normal_results_count,
    getLabTestResultTypeCount(r.lab_test_code, 'abnormal') AS abnormal_results_count,
    getLabTestCountByPatientAgeRange(r.lab_test_code, 18, 29) / COUNT(t.lab_test_code) AS
tests_on_18_29_pencent,
    getLabTestCountByPatientAgeRange(r.lab_test_code, 30, 39) / COUNT(t.lab_test_code) AS
tests_on_30_39_pencent
FROM lab_test_results r
    INNER JOIN lab_tests t USING (lab_test_code)
WHERE r.lab_test_date BETWEEN startdate AND endate
GROUP BY t.lab_test_code, t.name
HAVING tests_count > 1
ORDER BY tests_count DESC, t.lab_test_code DESC;

END$
DELIMITER ;

```